



**FINAL REPORT**

# TENNESSEE LONG-RANGE TRANSPORTATION PLAN

**PROJECT EVALUATION SYSTEM**

**DECEMBER 2005**



Prepared by  
The PBS&J Consultant Team



**Tennessee Long-Range Transportation Plan**

**Project Evaluation System  
Final Report**

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# Executive Summary

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## ES.1 Purpose of the Report

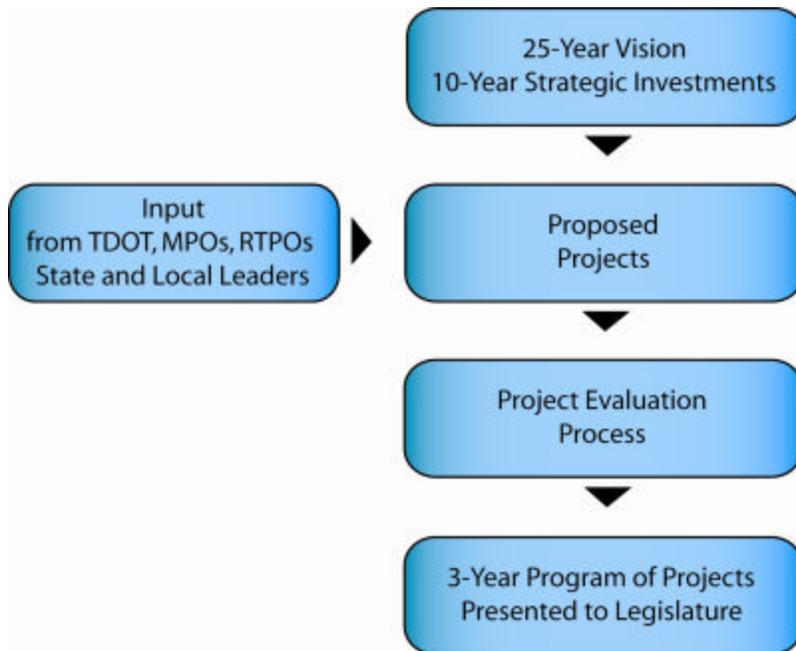
The *Project Evaluation System (PES) Report* is an analytical methodology to aid programming efforts and prioritize multimodal investments. The methodology consists of both quantitative and qualitative evaluation criteria built upon the Guiding Principles, goals, objectives, and policies established in Tennessee’s Long-Range Transportation Plan (LRTP). The PES serves as both a prioritization tool and a system of accountability designed to maximize public investment in transportation system improvement projects.

The PES is part of the LRTP, which consists of three principal elements:

- 25-Year Vision Plan, which broadly defines how Tennessee will respond to the trends and challenges facing the transportation system.
- 10-Year Strategic Investments Program (SIP), which identifies critical investments that warrant accelerated funding or special attention over the next 10 years.
- A 3-Year Project Evaluation System (PES), which guides the selection of the 3-year program of projects giving state and local leaders a broader view of projects under development.

Figure ES-1 is an overview of how a transportation need develops into a project in the 3-year program. As shown, the process relies on local input and various LRTP elements, of which the PES is an important component.

**Figure ES-1. Integrated Transportation Program Delivery Process**



Tennessee's transportation programming process is undergoing a fundamental change that will provide greater value and transparency based on data-driven performance measures and project evaluation criteria. The PES is intended to be an unbiased methodology for selecting projects that produce a more efficient, equitable, and multimodal transportation system. This approach affords TDOT the ability to be proactive in developing multimodal projects of the highest performance with available funding. The PES will also achieve a higher level of accountability to Tennessee residents for new transportation projects.

## ES.2 Guiding Principles

The LRTP includes Guiding Principles that serve as a thread through the planning and program delivery process. During this process, goals and objectives are identified, 25-year funding recommendations and 10-year strategic initiatives are developed, and projects are programmed for implementation. The PES consists of evaluation criteria developed for all transportation modes based on the Guiding Principles to aid in the programming of projects.

The seven Guiding Principles of the Tennessee LRTP are:

- Preserve and Manage the Existing Transportation System
- Move a Growing, Diverse, and Active Population
- Support the State's Economy
- Maximize Safety and Security
- Build Partnerships for Livable Communities
- Promote Stewardship of the Environment
- Emphasize Financial Responsibility

## ES.3 Existing Project Selection Practices

TDOT, as all other state departments of transportation, is required to develop a 3-Year Statewide Transportation Improvement Program (STIP) as a condition to receiving federal funds from the Federal Highway Administration and the Federal Transit Administration. Also, TDOT developed an annual Program of Projects for **highways**, which identified the specific phase of work to be funded and accomplished during the upcoming fiscal year. The general criteria for making programming decisions for the Program of Projects included geographic distribution, corridor commitments, budget limitations, political commitments, and local support of a particular project. TDOT executive management recommended to the Governor and the State Legislature projects that had gone through the advance planning report process and which should enter the annual program to begin project development.

TDOT neither owns nor operates any **transit** systems. The state's role in transit is to support local programs, initiatives, and projects. TDOT provides financial assistance for the operation of 25 public transit systems serving all 95 counties in the state. TDOT serves as the recipient and administrator of federal transit assistance funds for all small and rural systems and of federal planning and technical assistance funds for urbanized areas and statewide projects.

The state also provides capital assistance to public and private non-profit organizations that provide transportation services to the elderly and disabled. It also administers a ridesharing and vanpooling program and offers technical assistance to transit providers.

As with transit, TDOT owns no **airports** in Tennessee, with the exception of one public use airport at Reelfoot Lake State Park. Airports are owned by local governments, airport authorities, or private entities.

Each year, as part of the identification of projects for consideration in the State Airport Capital Improvement Program, TDOT hosts roundtable meetings at which airport owners can request projects to be included in the program. For airport projects, TDOT has developed a priority ranking system that considers safety, security, standards and capacity criteria, functional classification, based aircraft, and maintenance and preservation needs. Projects must meet eligibility criteria to be advanced through the project development phases.

Tennessee has 20 shortline **railroads** operating on approximately 810 miles of track; they are owned by local authorities made up of local government officials (cities and counties) through which the railroad operates. For each railroad, a needs assessment was completed showing the current and future needs and costs to upgrade the tracks to desired standards. TDOT allocates available funding for rail improvements to each of the rail authorities based on the ratio of needs to the statewide total. The local authority then selects the proposed improvements to be implemented with the available funding.

TDOT's program for **waterways** is limited. Funding is provided to the Tennessee-Tombigbee Waterway Authority to promote commerce and trade, industrial development, and recreational tourism for the region. TDOT also provides coordination and technical assistance in port development and the intermodal access needs that may be required.

TDOT does not have a separate funding program for **bicycle and pedestrian** projects except for the federal Transportation Enhancement Program (which has bicycles and pedestrians as an eligible project category). Bicycle and pedestrian projects are implemented as part of the highway improvement program. Where local governments have an adopted bicycle plan, TDOT will incorporate provisions for bicycles and pedestrians in their plans for improvements to the state highway system. Also, TDOT has developed and signed statewide bicycle routes and has included provisions for bicycles on paved shoulders in construction, reconstruction, widening, and resurfacing projects.

A number of **sub-allocated highway programs** are implemented by TDOT; each has specific data requirements relative to the specified program to determine eligibility and priority for using the available funds. The federal sub-allocated programs are:

- Bridge Replacement and Rehabilitation Program
- Safety Improvement Program (including Rail-Highway Grade Crossings)
- Transportation Enhancement Program
- Forest Highway Program

The state sub-allocated programs are:

- State Industrial Access Road Program
- Local Interstate Connector Route Program
- Interchange Lighting Program
- State Bridge Grant Program

#### **ES. 4 Peer State Practices**

A review of peer states was completed to understand how other states develop their State Transportation Improvement Program, and how they select projects using various criteria. Each state has similar practices, and all follow the requirements of the federal Transportation Equity Act for the 21st Century (TEA-21, 1998). Many states, however, have developed processes that are open to the public, promoting an understanding of how projects are selected and built.

The Task C Report, “Peer State Planning Practices,” dated May 2003, completed as part of Phase 1 of the LRTP, reviewed five states (Florida, Maryland, North Carolina, Washington, and Wisconsin) and their planning practices. Section 2.9 of that report, Programming of Transportation Improvements, discusses the processes used by each state in the budgeting and development of their short-range (3- to 6-year) improvement programs. Those practices are not detailed in this report. States selected for discussion in this report are Oregon, Virginia, Missouri, Minnesota, and Georgia.

The key observations from the review of state practices included in this report are summarized below.

- These states are continuing to develop processes to find ways to more effectively and efficiently invest limited resources available for transportation.
- The states consider both technical and subjective measures to decide on which transportation proposals to fund.
- Public input and working with other agencies and organizations such as Metropolitan Planning Organizations and Regional Planning Organizations play a key role in the planning and programming process.
- Although the major focus in developing short-range programs is on the highway mode, states are considering multimodal and intermodal solutions to corridor deficiencies and sub-area transportation plans.
- Maintenance and preservation of the existing system continues to be a top priority of the state departments of transportation.

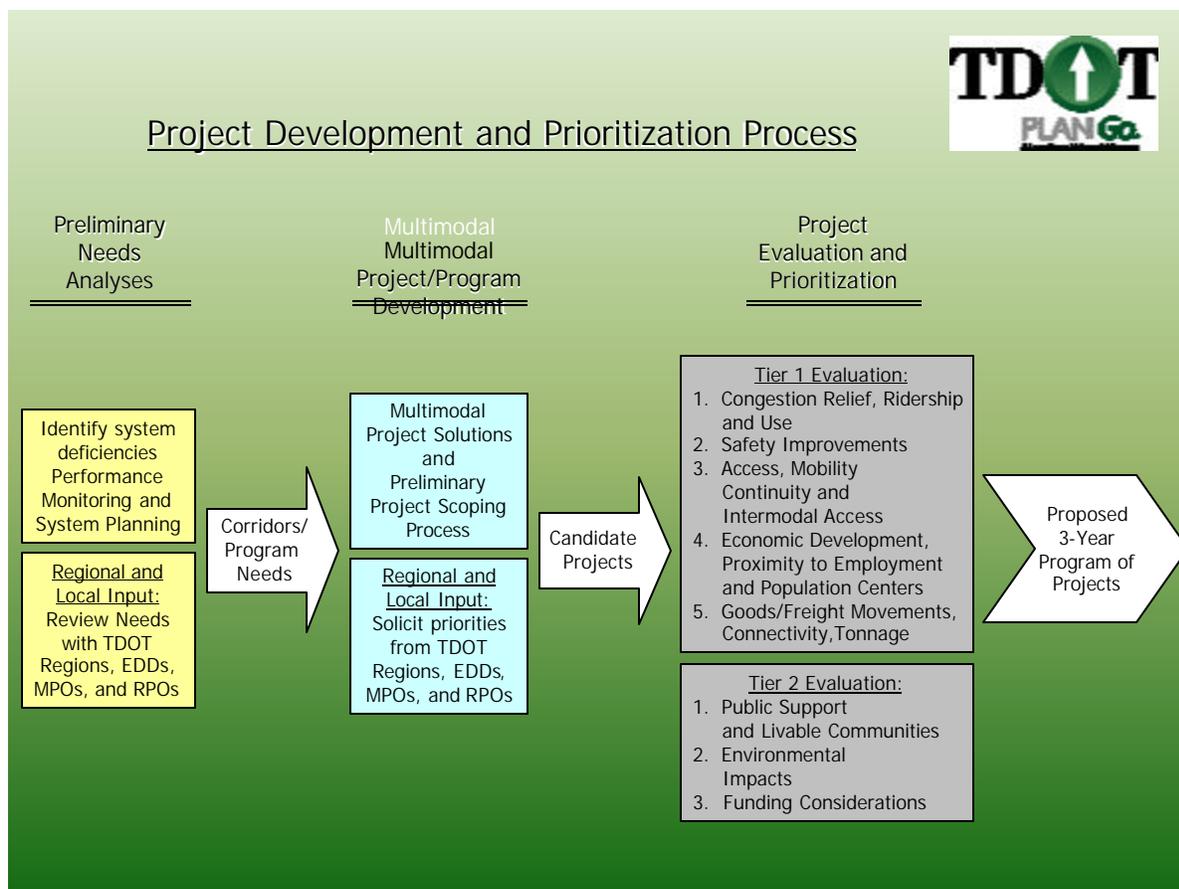
#### **ES.5 Recommended Project Prioritization and Evaluation System**

The project development process begins with preliminary needs analyses determined through system planning, goals and objectives, and the desired performance of the transportation system. A preliminary project scoping process begins to study deficiencies and develop project data for possible solutions. The multimodal project development phase involves regional and local input and a proactive public involvement process. The public input and project data are used to determine desirable and appropriate candidate projects to solve system deficiencies and modal needs. The PES serves as an analytical methodology to aid programming efforts and prioritize

multimodal investments. Qualified projects are then programmed into the 3-Year Program of Projects in an open, public, and financially constrained manner.

Candidate projects are prioritized according to the PES criteria established for each mode. The prioritized list of projects resulting from the PES is used to help guide decisions on which projects to fund in the 3-Year Program of Projects. Engineering and transportation planning judgment are imperative for the consideration and inclusion of multimodal projects, transportation demand management strategies, and intelligent transportation systems technology in solving transportation needs along strategic corridors. While candidate projects are evaluated individually, selected projects for the 3-year program must fit together in a holistic and practical multimodal framework to create a seamless, efficient overall transportation system. The project development and prioritization process that leads to the proposed 3-year program is shown in Figure ES-2.

**Figure ES-2. Project Development and Prioritization Process**



Throughout the LRTP, the cost of transportation needs, and current and proposed spending has been assigned to three broad categories that define general, mode-neutral cost allocation. These categories are maintenance and system preservation, safety and system modernization, and system expansion and enhancement. The PES recommended in this report will help guide the selection of transportation investments in the categories of expansion/enhancement and, to some extent, safety/modernization. This process applies only to New Start projects. Projects or

investments in the maintenance/preservation category are determined using established guidelines and procedures for each specific program.

The recommended PES is a two-tiered approach to project prioritization and project evaluation. Tier 1 evaluates projects based on mode-specific, technical measures. These measures address Guiding Principles 1, 2, 3, and 4 as described in Section 1.2 of this report. The evaluation measures used for Tier 1 are congestion relief, use/ridership data, access and mobility, economic development opportunities, goods and freight movement, and safety and security.

Tier 2 evaluates projects based on mode-neutral, generally qualitative measures. These measures address Guiding Principles 5, 6, and 7 as described in Section 1.2 of this report. The evaluation measures used in Tier 2 are public and community support, environmental impacts, and funding considerations.

The recommended Tier 1 and Tier 2 evaluation measures and criteria for each mode are shown in the table on the following page.

## **ES 6. Conclusion**

The PES is comprised of modal criteria to prioritize highway, transit, airport, rail, waterway, and bicycle and pedestrian projects. These criteria are developed for each mode in accordance with the Guiding Principles, performance measures, goals and objectives, and policies established in the LRTP. Candidate projects are prioritized using a two-tiered approach that evaluates both quantitative and qualitative project data and considerations. Tier 1 evaluates quantitative project data to determine improvements to capacity and system use, access and mobility, economic development, goods and freight movement, and safety. Tier 2 evaluates qualitative project characteristics and is included in the PES to help determine transportation solutions for the overall transportation system. These Tier 2 criteria include an assessment of public and community support, environmental impacts, and funding considerations. Thus, the PES establishes a methodology to prioritize candidate projects based on merit and without modal or geographic bias.

The highway PES was used in the development of TDOT's 3-Year Program of Projects approved by the State Legislature in May 2005. Candidate New Start projects were successfully evaluated to develop a list of prioritized projects to be funded. Implementation of the PES demonstrates a fundamental change in TDOT's operating procedures in order to provide greater transparency based on data-driven performance measures and project evaluation criteria. Multimodal project development considerations and the complete multimodal project prioritization and evaluation system should be used to the extent possible as future updates to the 3-year program are undertaken. This will help to ensure that the best projects are implemented to satisfy Tennessee's transportation needs.

The PES does not require that projects meet or exceed a certain numeric scoring in order to be funded in the 3-year Program of Projects. This process is a means to assist TDOT decision makers in evaluating and comparing candidate projects. TDOT will continue to retain final decision-making authority on transportation improvements to be included in the program. It is intended that the process outlined will (1) continue to evolve and improve over time, (2) continue to make refinements and enhancements in methodology, and (3) develop and incorporate new data sources and measures into the process.

Criteria for Multimodal Project Evaluation and Prioritization

Evaluation Measure	Highway	Transit	Bicycle/Pedestrian	Rail	Aviation	Waterways
<b>Congestion Relief, Ridership, and Usage</b>	<ul style="list-style-type: none"> <li>Level of current and future congestion (traffic volume)</li> </ul>	<ul style="list-style-type: none"> <li>Existing and potential annual ridership per capita</li> </ul>	<ul style="list-style-type: none"> <li>High probability of usage or contribution to providing viable modal choices</li> </ul>	<ul style="list-style-type: none"> <li>Rail usage/number of rail carloads</li> </ul>	<ul style="list-style-type: none"> <li>Number of based aircraft</li> </ul>	<ul style="list-style-type: none"> <li>Enhancement of intermodal access</li> </ul>
<b>Access and Mobility</b>	<ul style="list-style-type: none"> <li>Improvement to route continuity</li> <li>Enhancement of intermodal access</li> <li>Service to major attractors and generators</li> </ul>	<ul style="list-style-type: none"> <li>Number of route miles of service provided, hours, and frequency of service</li> <li>Capacity for new riders including elderly and disabled</li> <li>Convenience and quality of travel</li> <li>Improvements to route continuity, intermodal access, and proximity to major attractors and generators</li> </ul>	<ul style="list-style-type: none"> <li>Improvements to route continuity and intermodal connectivity</li> <li>Proximity to major attractors and generators such as community centers, schools, parks, and employment and retail centers</li> <li>ADA accessibility enhancements</li> </ul>	<ul style="list-style-type: none"> <li>Tonnage of bulk commodities/products shipped per month</li> <li>Improvement to route continuity</li> <li>Connectivity and intermodal access</li> <li>Identification in Needs Assessment</li> </ul>	<ul style="list-style-type: none"> <li>Enhancement of intermodal access</li> <li>Identification in Airport Layout Plan</li> </ul>	
<b>Economic Opportunity</b>	<ul style="list-style-type: none"> <li>County seat connections</li> </ul>	<ul style="list-style-type: none"> <li>Access to/from major population areas to employment centers</li> </ul>	<ul style="list-style-type: none"> <li>State tourism and land-use redevelopment potential, visitor interest and activity</li> </ul>	<ul style="list-style-type: none"> <li>Number of manufacturers and shippers served</li> </ul>	<ul style="list-style-type: none"> <li>High unemployment area</li> </ul>	<ul style="list-style-type: none"> <li>Increase to channel depth</li> </ul>
<b>Goods and Freight Movements</b>	<ul style="list-style-type: none"> <li>High population growth or high unemployment areas</li> <li>Connectivity and access to major population, employment, and manufacturing/industrial centers</li> <li>Amount of freight movement and percentage of trucks</li> <li>Potential for new job creation/retention</li> </ul>	<ul style="list-style-type: none"> <li>High population growth or high unemployment area</li> <li>Encouragement of higher density development and local objectives for land use policies</li> <li>Redevelopment potential to enhance/create/retain jobs</li> </ul>	<ul style="list-style-type: none"> <li>Connectivity to major population and employment centers</li> <li>Benefit to underserved populations and locations</li> <li>Potential for enhancement of local economies (e.g., bicycle shops, new cafes, and local programs)</li> </ul>	<ul style="list-style-type: none"> <li>Diversion from trucks</li> <li>Partnerships with development agencies</li> <li>Potential for new job creation/retention with priority to high unemployment areas</li> </ul>	<ul style="list-style-type: none"> <li>Economically depressed counties</li> <li>Proximity to major population and employment centers</li> <li>Potential for new job creation/retention with priority to high unemployment areas</li> </ul>	<ul style="list-style-type: none"> <li>Lock capacity and efficiency</li> <li>Tonnage of freight movement</li> <li>Number of barges</li> <li>Potential for new job creation/retention with priority to high unemployment areas</li> </ul>
<b>Safety and Security</b>	<ul style="list-style-type: none"> <li>Improvements to geometric deficiencies such as horizontal and vertical alignment, narrow lanes, and shoulders</li> <li>Potential to reduce crash rate and severity</li> </ul>	<ul style="list-style-type: none"> <li>Safer environment for transit passengers and employees</li> <li>Potential reduction of injuries and fatalities</li> <li>Reliability of vehicle fleet</li> </ul>	<ul style="list-style-type: none"> <li>Gap and barrier mitigation</li> <li>Improvement to geometric deficiencies such as narrow lanes or lack of shoulders</li> <li>Potential to reduce crash rate and severity</li> </ul>	<ul style="list-style-type: none"> <li>Improvements to interface of rail and other modes</li> <li>Improvements to track or bridge conditions</li> </ul>	<ul style="list-style-type: none"> <li>State license</li> <li>Rules and regulations</li> <li>Compliance controls</li> <li>Emergency services</li> </ul>	<ul style="list-style-type: none"> <li>Dam and lock modernization</li> </ul>
<b>Public and Community Support</b>	<ul style="list-style-type: none"> <li>Adherence to local land use plans, major thoroughfare plans, corridor studies, master plans, and regional and local long-range plans or modal plans.</li> <li>Local official and overall community support and continuity with local goals and initiatives.</li> <li>Consistency with transportation demand management programs, congestion management systems, intelligent transportation systems, and access management plans.</li> </ul>					
<b>Environmental Impacts</b>	<ul style="list-style-type: none"> <li>Impacts to neighborhoods, communities, and historic and archaeological sites.</li> <li>Reduction or mitigation of impacts on wetlands, watersheds, ecosystems, air quality, and water quality.</li> </ul>					
<b>Funding Considerations</b>	<ul style="list-style-type: none"> <li>Adhere to fiscal responsibilities, financial feasibility, efficiency, project readiness, and long-term economic impacts.</li> <li>Geographic balance (rural/urban) for statewide distribution of funds.</li> <li>Build on public/private partnerships.</li> <li>Use jurisdictional and interagency cooperation and local and private contributions.</li> </ul>					

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## Acronyms and Abbreviations

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ADA	Americans with Disabilities Act of 1990
EDD	Economic Development District
GDOT	Georgia Department of Transportation
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
LOS	Level of service
LRTP	Long-Range Transportation Plan
MIN	Multimodal Investment Network
MPO	Metropolitan Planning Organization
ODOT	Oregon Department of Transportation
PES	Project Evaluation System
RPO	Regional Planning Organization
SAFETEA-LU	Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2005– A Legacy for Users
STIP	State Transportation Improvement Program
STP	Surface Transportation Program
TDOT	Tennessee Department of Transportation
TEA-21	Transportation Equity Act for the 21st Century of 1998
TIP	Transportation Improvement Program
VDOT	Virginia Department of Transportation

## Chapter 1

# Introduction

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The federal Transportation Equity Act for the 21st Century (TEA-21, 1998) established the need to consider alternative transportation modes when planning and prioritizing projects. The legislation called for the examination of diverse transportation improvement projects with the intent that the selected projects fit together in a holistic and practical multimodal framework. Transportation planning is the process of defining problems, identifying candidate solutions, evaluating alternatives, gathering public input, and recommending a set of specific projects. Transportation programming is the process of determining when recommended projects are funded or programmed within budgetary constraints. An important consideration in choosing future projects is the extent to which they help achieve the 2030 Vision identified in Tennessee's Long-Range Transportation Plan (LRTP). A key component of this plan is to develop a Project Evaluation System (PES) to be used for selecting and programming projects.

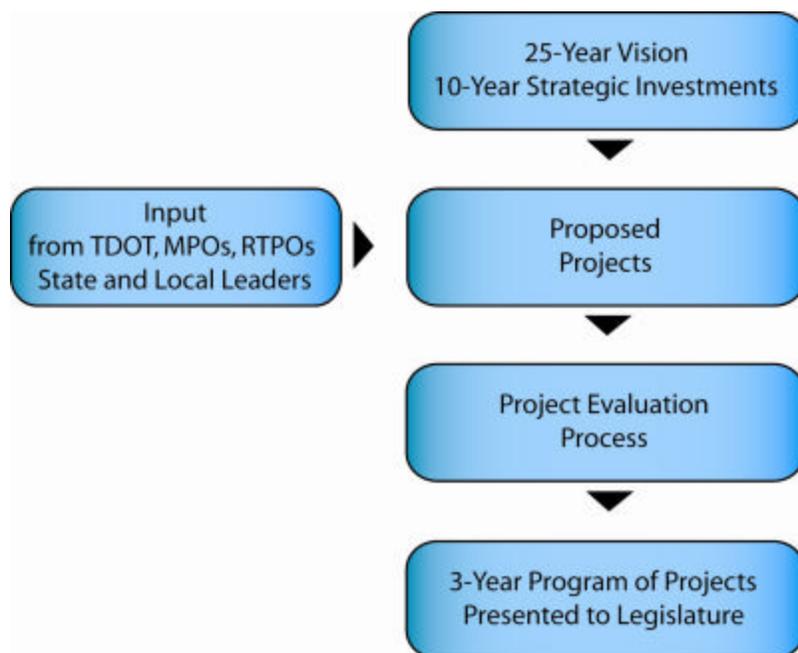
The PES is an analytical methodology to aid programming efforts and prioritize multimodal investments. The methodology consists of both quantitative and qualitative evaluation criteria built upon the Guiding Principles, goals, objectives, and policies established in Tennessee's LRTP. The PES serves as both a prioritization tool and a system of accountability designed to maximize public investment in transportation system improvement projects. The intent of the PES is to provide transparency and allow an open and objective evaluation and comparison of these projects. Once candidate projects have been prioritized using the PES, a financially constrained list of multimodal projects is incorporated into the 3-Year Program of Projects, which is updated annually.

The PES and resultant 3-Year Program of Projects are part of the LRTP, which consists of three principal elements:

- 25-Year Vision Plan, which broadly defines how Tennessee will respond to the trends and challenges facing the transportation system.
- 10-Year Strategic Investments Program (SIP), which identifies critical investments that warrant accelerated funding or special attention over the next 10 years.
- A 3-Year PES, which guides the selection of the 3-year program of projects giving state and local leaders a broader view of projects under development.

The basic structure of the Integrated Transportation Program Delivery Process is shown in Figure 1. Figure 1 is an overview of how a transportation need develops into a project in the 3-year program. As shown in Figure 1, this process relies on local input and various LRTP elements, of which the PES is an important component in the development of the 3-year program of projects.

**Figure 1. Integrated Transportation Program Delivery Process**



## 1.1 Purpose of Report

Tennessee's transportation programming process is undergoing a fundamental change that will provide greater value and transparency based on data-driven performance measures and project evaluation criteria. The PES is intended to be an unbiased methodology for selecting projects that produce a more efficient, equitable, and multimodal transportation system. This affords TDOT the ability to be proactive in developing multimodal projects of the highest performance relative to available funding. The PES should also achieve a higher level of accountability to citizens of Tennessee for new transportation projects.

This report is to be used by TDOT in the management and implementation of the 3-Year Program of Projects. Existing TDOT project evaluation procedures and best practices of other states and transportation agencies are summarized in the report. This report is comprised of three major subject areas: (1) existing TDOT project evaluation procedures and practices, (2) peer state project evaluation systems and practices, and (3) the recommended project prioritization and evaluation system.

Evaluation criteria are developed for each transportation mode according to the Guiding Principles, goals and objectives, performance measures, and policies of the LRTP. The recommended project development and prioritization process identifies specific technical criteria for each transportation mode described in this report as well as non-technical criteria that apply across all modal projects.

## **1.2 Guiding Principles**

TDOT has adopted Guiding Principles to serve as a thread of continuity through the planning and program delivery process. During this process, goals and objectives are identified, 25-year funding recommendations and 10-year strategic initiatives are developed, and projects are programmed for implementation. The PES, which is to aid in the programming of projects, consists of evaluation criteria developed for all transportation modes based on the Guiding Principles.

### **Guiding Principle 1: Preserve and Manage the Existing Transportation System.**

The general sentiment across the state from the public involvement process is that “Tennessee has good roads, and we need to preserve and maintain what we have.” Therefore, the 25-year Vision for Tennessee includes a substantial continued investment in preserving and maintaining the existing infrastructure. These maintenance and preservation projects will be determined according to existing TDOT Sub-Allocated Highway Programs, such as the Bridge Replacement Program and the Resurfacing and Maintenance Program. The existing TDOT project evaluation procedures and practices for sub-allocated highway programs are further discussed in Chapter 2. The PES is intended for new projects generally related to system modernization, safety, expansion, and enhancement. Therefore, criteria in the PES are selected primarily to satisfy the remaining six Guiding Principles.

### **Guiding Principle 2: Move a Growing, Diverse, and Active Population.**

Factors that indicate how well a project will move a growing and diverse population include congestion relief, accessibility, and mobility. Criteria are used to evaluate how well a project fits within land use plans to make destinations as accessible as possible. Another consideration is how well a project enhances mobility and modal choices so that all transportation customers have equal access. Projects that enhance intermodal connections improve the convenience and function of the modal choices.

### **Guiding Principle 3: Support the State’s Economy.**

Economic development potential is used to determine how well transportation investments may support the state’s economy. For example, a transportation project could stimulate growth in a region, or encourage new industry to develop. If a transportation project is necessary to entice an industry to relocate in Tennessee, the project has a measurable impact on the creation of jobs. Goods and freight movement are also indicators of how well a transportation project might improve efficiency and benefit the state’s economy.

### **Guiding Principle 4: Maximize Safety and Security.**

Safety improvements that would reduce crash risk, benefit security, and ultimately save lives are important considerations for transportation projects.

### **Guiding Principle 5: Build Partnerships for Livable Communities.**

Public and community support are factors to gauge the role of transportation projects in contributing to livable communities. Criteria are developed to evaluate how well a project meets community goals and expectations.

**Guiding Principle 6: Promote Stewardship of the Environment.**

Each project's potential impact on manmade and natural environments needs to be understood. Minimizing noise levels and pollution, improving aesthetics, and preserving neighborhood, historical and cultural assets are critical to a community's health. Managing impacts on ecosystems, especially air and water, is essential to environmental stewardship.

**Guiding Principle 7: Promote Financial Responsibility.**

Funding considerations address the financial feasibility of projects and their cost to benefit ratio. These criteria also recognize projects that leverage resources such as public-private partnerships or projects that are accompanied by the highest federal matching funds.

Specific project evaluation criteria are described in detail according to their respective transportation mode in Chapter 4.

## Chapter 2

# Existing Project Evaluation Procedures and Practices

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This chapter describes in general terms the activities and processes associated with the preparation of the past annual Programs of Projects and the State Transportation Improvement Program (STIP). The STIP is a federally required document prepared by all state departments of transportation as a condition to receiving federal funds from the Federal Highway Administration and the Federal Transit Administration. The STIP covers at least a 3-year period.

In addition to discussing current processes for highway and transit projects, this chapter also describes how other modes are considered in the TDOT annual budgeting process. Also included are the numerous sub-allocated programs identified in federal and state legislation.

TDOT currently prepares a 3-year STIP for highway and transit projects, with the first year for highways being identical to the 1-year project listing submitted to the State Legislature. The new SAFETEA-LU bill extends the STIP and the Transportation Improvement Program (TIP) for urbanized areas to 4 years. In the future, TDOT will prepare a 3-year multimodal Program of Projects and include projects for all transportation modes and submit the document to the State Legislature to support their budgeting process. The 3-year Program of Projects will replace the current 1-year project listing for highways. The first year would be firm, as funding would be committed for that fiscal year. The second and third years would be flexible and could be adjusted as necessary to reflect unique circumstances.

## 2.1 Highways

In the past, TDOT has developed an annual program for highway projects, which identified the specific phase of work to be funded and accomplished during the upcoming fiscal year. For example, a project that was previously funded for right-of-way and will be ready for a contract in the coming year is considered for construction funding. Likewise, a project in the preliminary engineering or design phase that will be ready for right-of-way acquisition in the coming year is considered for right-of-way funding. After these considerations, New Start projects to begin the location/environmental study phase of project development are considered for funding in the annual program.

Candidate New Start projects have usually gone through the Advance Planning Report process. An Advance Planning Report considers and contains logical termini for proposed projects, includes traffic volume data, improvement alternatives, and typical cross-sections, functional plans and estimate of cost, and a preliminary review of environmental issues. The general criteria for making programming decisions include geographic distribution, corridor commitments, budget limitations, political commitments, and local support of a particular project. TDOT executive management recommends to the Governor and State Legislature projects that have gone through the Advance Planning Report process and which will enter the annual program to begin the project development process.

## **2.2 Transit**

TDOT neither owns nor operates transit systems. The state's role in transit is to support local programs, initiatives, and projects. TDOT provides financial assistance for the operation of 26 public transit systems serving all 95 counties in the state. TDOT serves as the recipient and administrator of federal transit assistance funds for all small and rural systems and of federal planning and technical assistance funds for urbanized areas and statewide projects. To receive funds, TDOT submits applications to the Federal Transit Administration. TDOT administers the contracts for the awarded grants with state and local transit providers and monitors their compliance with federal and state regulations.

TDOT also provides capital assistance to public and private non-profit organizations that provide transportation services to the elderly and disabled. It also administers a ridesharing and vanpooling program and offers technical assistance to transit providers. For most capital assistance projects, TDOT provides one half of the required matching funds in cooperation with local governments.

## **2.3 Airports**

As with transit, TDOT owns no airports in Tennessee, with the exception of one public use airport at Reelfoot Lake State Park. Airports are owned by local governments, airport authorities, or private entities.

Each year as part of the identification of projects for consideration in the State Airport Capital Improvement Program, TDOT hosts roundtable meetings at which airport owners can request projects to be included in the program. For airport projects, TDOT has developed a project priority ranking system that considers safety, security, standards and capacity criteria, functional classification, based aircraft, and maintenance and preservation needs. Due to uncertainties of the availability of local funds, project requests and implementation are typically handled on the basis of when local funding is available. However, projects must meet the eligibility criteria to be advanced through the project development phases.

## **2.4 Rail**

Tennessee has 20 shortline railroads operating on approximately 810 miles of track; they are owned by local authorities made up of officials of local governments (cities and counties) through which the railroad operates. Usually, the local authority contracts with a shortline railroad operator to provide rail service to the area.

For each railroad, a needs assessment was completed showing the current and future needs and costs to upgrade the tracks to desired standards. TDOT allocates the available funding for rail improvements to each of the rail authorities based on the ratio of needs to the total statewide. The local authority then selects the proposed improvements to be implemented with the available funding. TDOT provides technical assistance to each railroad as needed to complete the projects identified.

## **2.5 Waterways**

The state's program for waterways is limited. Currently, funding is provided to the Tennessee-Tombigbee Waterway Authority to promote commerce and trade, industrial development, and recreational tourism for the region. TDOT also provides coordination and technical assistance in port development and the intermodal access needs that may be required. TDOT does not have a capital improvement program for waterway projects.

## **2.6 Bicycles and Pedestrians**

Currently, the state does not have a separate funding program for bicycle and pedestrian projects, except for the federal Transportation Enhancement Program (which has bicycles and pedestrians as an eligible project category). Bicycle and pedestrian projects are implemented as part of the highway improvement program. Where local governments have an adopted bicycle plan, TDOT will incorporate provisions for bicycles and pedestrians in their plans for improvements to the state highway system. Also, TDOT has developed and signed statewide bicycle routes and has included provisions for bicycles on paved shoulders in construction, reconstruction, widening, and resurfacing projects. TDOT has a Bicycle/Pedestrian Coordinator who reviews projects to ensure compatibility between state and local activities.

## **2.7 Sub-Allocated Highway Program Categories Evaluation Processes**

Federal transportation legislation includes specific programs with identified funding or as a sub-program of a major funding category. These programs play an important role in addressing the needs of the transportation system and call for specific data requirements relative to the specified program to determine the eligibility and priority for using available funds.

In addition to the federal programs, the state legislature has created other state-funded programs to meet the transportation needs and assist local governments in realizing overall development goals and opportunities.

The sections below discuss the primary federal and state programs and generally describe how these programs are implemented.

### **2.7.1 Federal Programs**

#### **Bridge Replacement and Rehabilitation Program**

This program provides funding to assist states in their program to address deficient bridges and to seismic retrofit bridges on any public road. The matching ratio for use of these funds is 80 percent federal/20 percent state or local. Up to 35 percent of the available federal funds are to be spent on public off-system bridges (local roads).

TDOT uses bridge management software called PONTIS as a planning tool to help forecast future bridge conditions. All public bridges are subjected to an intensive inventory and appraisal process every 2 years. Bridges determined to be in critical condition are inspected more frequently.

As a result of the inventory and appraisal process, bridges are assigned a “sufficiency rating” on a scale of 0 to 100, with 100 being best case. Candidate bridges for replacement or rehabilitation are selected for the annual Program of Projects according to the most critical sufficiency rating based on program funding available.

### **Safety Improvement Program**

Federal funds are set aside from the Surface Transportation Program (STP) to address safety improvement projects (i.e., high hazard accident locations and rail-highway grade crossings). Using accident report data obtained from the Department of Safety, TDOT calculates a 3-year statewide average accident rate for sections, spots, intersections, bridges, and railroad grade crossings. The statewide average accident rates are classified by rural and urban and by type of highway facility (two-lane, four-lane, divided, undivided, etc.). The statewide average accident rates are then used to identify locations that have accident rates above the statewide average. Finally, potential projects are evaluated for funding under the Hazard Elimination Program.

In addition to the Hazard Elimination Program, TDOT makes funds available to local governments in an Optional Safety Local Program to assist certain types of safety projects on local roads. Local officials identify the potential safety hazard and works with the Regional Traffic Engineer to follow the guidelines and process for approval and funding. Projects such as guardrails, sight distance improvements, and traffic signals are implemented under this program.

Rail-Highway Grade Crossing projects are part of the funding set-aside for safety improvements from the STP. Candidate locations are identified by calculating an “exposure index,” which takes into account the volume of highway traffic, number of train movements, speed limit, train speed, and sight distance. A “diagnostic team” reviews the locations to determine the types and costs of improvements for consideration annually based on funding available for this program.

### **Transportation Enhancement Program**

The Transportation Enhancement Program is a federal program administered by TDOT and is funded by a 10 percent set-aside from the STP. The funding is intended for projects that go beyond what is customarily provided by traditional transportation projects and provides for a variety of eligible activities ranging from restoration of historic transportation facilities, bicycle/pedestrian facilities, to landscaping and scenic beautification and mitigation of water pollution from highway runoff.

TDOT has developed a comprehensive instruction booklet and application process for evaluating project requests from local governments. Applications for projects are accepted annually and are evaluated based on criteria developed specifically for this program. Approved projects are implemented by the local governments following state and federal guidelines and regulations.

### **Forest Highway Program**

The Forest Highway Program is a federal category that provides funding for improvements to highways that are part of the Forest Highway System serving the national forests. Available funding varies from year to year. A meeting is held annually between TDOT, the Federal Highway Administration, and the U.S. Forest Service to review the status of ongoing projects and establish priorities for future projects and activities.

## **2.7.2 State Programs**

### **State Industrial Access Road Program**

The Industrial Highway Act of 1959 authorized TDOT to contract with cities and counties for the development of “industrial highways” in order to provide access to industrial areas and sites and to facilitate the development of new industry and expand existing industries in the state. This program is carried out in cooperation with the Department of Economic and Community Development and assists their efforts to attract new and expanding industry to Tennessee. Funding for this program is included in TDOT’s annual budget based on anticipated needs working in concert with Department of Economic and Community Development representatives.

Local governments submit applications for funding industrial highways and provide information on the proposed industry in order for TDOT to determine the economic impact and benefit/cost of the proposed project. Projects are approved by TDOT based on project eligibility and available funding.

### **Local Interstate Connector Route Program**

The Local Interstate Connector Route Act of 1965 authorized TDOT to contract with cities and counties to establish and construct a system of connector routes to provide adequate access to the Interstate Highway System from existing road and street networks along interstate highways.

TDOT has established guidelines and an application process for local governments to follow in requesting assistance through this program. Approved projects are cost shared between TDOT and local governments on a 50-50 basis. Funding is established in TDOT’s annual budget based on anticipated needs in the program. TDOT conducts appropriate studies to determine the cost and feasibility of proposed projects. Local governments assume full responsibility for future maintenance of completed connector projects.

### **Interchange Lighting Program**

Local governments may request lighting of an interstate interchange within their jurisdiction if certain criteria are met. Approved projects are funded between TDOT and the local government on a 50-50 basis. This program is primarily for interchange locations that have significant commercial development and where lighting is needed to improve safety and operation of the interchange.

### **State Bridge Grant Program**

The State Bridge Grant Program was established to assist local governments with the replacement or rehabilitation of deficient bridges under their jurisdiction. The first priority of the program is bridges with an H-load rating less than 10 tons. Candidate structures appear on an annual selection list, and funds are offered to the local government with the highest-priority bridge on the list. In general, eligible bridges must be less than 100 feet long; however, they may be up to 150 feet long if the average daily traffic exceeds 200. TDOT works with the county to develop the contract between the county and state, authorize payment to the local government for ongoing projects, and conduct a final inspection on completed projects.

## Chapter 3

# Peer State Project Evaluation Systems and Practices

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An extensive review of peer states was completed to understand how other states develop their STIPs, and how they select projects. States have similar practices, and all follow the requirements of TEA-21. Many states, however, have developed processes that are open and strive to provide information to the public to promote an understanding of how projects are selected and built.

In addition to the information in this chapter, reference is made to the Task C Report, “Peer State Planning Practices,” dated May 2003, and completed as part of Phase 1 of the LRTP. The report reviews the planning practices of five states: Florida, Maryland, North Carolina, Washington, and Wisconsin. Section 2.9 of that report, Programming of Transportation Improvements, discusses processes used by the states in budgeting and developing their short-range (3- to 6-year) improvement programs. Those practices are not detailed in this report.

After reviewing the practices of other states, Oregon, Virginia, Missouri, Minnesota, and Georgia were selected for further analysis of their prioritization processes for transportation improvement programs.

### 3.1 Oregon

The Oregon Department of Transportation (ODOT) sets priorities and identifies projects according to transportation system conditions and needs. Their STIP is a 4-year program that is updated every 2 years. ODOT uses information, recommendations, and advice from many public organizations, commissions, advocacy groups, local governments, and Metropolitan Planning Organizations to decide on the projects and priorities in their STIP. Projects are derived from corridor studies and plans and regional plans, and are consistent with LRTP objectives.

At the beginning of each STIP update, ODOT establishes the level of funding that will go into the different types of projects (such as maintenance/preservation, safety, public transit, transportation enhancements, bicycle and pedestrian facilities, and modernization). Project eligibility criteria and prioritization factors are then applied to candidate projects and matched to available funding. The eligibility criteria ensure that projects are part of an acknowledged comprehensive plan and/or transportation system plan and consistent with the goals and policies of the Oregon Transportation Plan. Prioritization factors consider traffic, congestion, safety, freight mobility, and bicycle/pedestrian issues. Subjective factors include project readiness, the leverage of other funds, public benefits, and whether a project furthers the policies of the overall transportation plan.

After the draft STIP is developed, it is available for a 45-day public review period. After all review material is compiled, the Oregon Transportation Commission approves the STIP.

### 3.2 Virginia

The Virginia Transportation Research Center has completed a study for the Virginia Department of Transportation (VDOT) entitled “Considerations in the Development of Procedures for

Prioritizing Transportation Improvement Projects in Virginia.” The purpose of the study was to explore issues and offer a template for a selection process and to prioritize construction projects in a transparent manner. VDOT staff identified four key constraints for development of the template:

- It must be transparent.
- It must be computationally feasible.
- It must be driven by available data or data that one can reasonably expect to become available in the future.
- It must reflect current issues.

The categories identified for consideration and scoring were:

- Accessibility and mobility
- Economic development
- Sufficiency
- Environment
- Connectivity
- System preservation

The report recommended that VDOT implement a transparent method for programming projects, with the understanding that the method will be modified as appropriate based on input from stakeholders and technical staff.

The VDOT develops a 6-Year Transportation Improvement Program. VDOT uses performance measures to gauge how well each proposed transportation improvement meets the associated goal. For example, the goal of facilitating the efficient movement of people and goods considers level of service, volume/capacity ratio, and passenger car equivalents. The safety goal considers the crash rate on a facility. The retention and increase of business and employment opportunities goal considers the local unemployment rate and volume of trucks. The quality of life goal considers potential environmental and cultural impacts and the utilization of existing right-of-way. The system preservation goal considers cost effectiveness, bridge condition, inclusion of bicycle/pedestrian provisions, intermodal access, and mainline adequacy. Bonus points are awarded to projects that are identified in Virginia’s multimodal investment network.

*VTrans2025* is the blueprint for transportation planning in Virginia and defines the overall vision, goals, objectives, and performance measures. The planning process involves identifying opportunities for substitutability and intermodal needs by all four of Virginia’s transportation modal agencies. The intent is to shift from focusing on individual modal capacity issues to focusing on the most efficient way to move people and goods throughout the state. When the process identifies high-priority multimodal solutions, these projects are included in the multimodal investment network and given increased consideration over single-mode solutions in their appropriate modal plan. Each multimodal investment network is scored based on the *VTrans2025* multimodal performance measures.

### **3.3 Missouri**

Missouri uses a 5-Year Schedule Plan of Projects that establishes work anticipated over that time frame. The plan is updated annually to reflect the completion status of Year 1 projects, and a new year is added as Year 5. Missouri considers six factors in prioritizing segments of high-priority corridors identified from their portion of the National Highway System. The six factors are:

- Pavement condition rating
- Congestion index rating
- Safety index rating
- System usage
- Connectivity rating
- Accessibility

Missouri places emphasis on public participation and partnerships. They use regional organizations (city and county officials) and Metropolitan Planning Organizations to allow those groups with common interests and goals to provide input into the transportation investments and programming process.

### **3.4 Minnesota**

Minnesota develops a 3-Year Statewide Program as called for by the TEA-21. The programming process includes activities in public participation, goals and objectives, area transportation partnerships, and project selection as well as the traditional steps of project identification, classification, evaluation, program development, review, and management.

Minnesota's transportation investment process with the area transportation partnerships provides for early and continuous involvement in the development of the 3-Year Statewide Program. In addition to the public meetings, forums, conferences, and focus groups, meetings are held throughout the state by the area transportation partnerships, the Minnesota Department of Transportation, and modal partners such as transit, rail, and bicycle/pedestrian interests.

The Statewide Program provides direction for investments through three policies: preserve existing elements of the transportation system, enhance access for economic development, and enhance safety and access in important interregional travel corridors.

Candidate projects are analyzed with respect to state goals, regional priorities, target funding, balance between modes, various federal categories of funding, and historic area-wide funding. Other parameters, such as National Highway System designation, may also be used in the analysis. Projects in the first year are selected for implementation. Projects in the second and third years may be advanced through project development to maintain the financial balance within each fiscal year.

### 3.5 Georgia

Georgia develops a 6-Year Construction Work Program and follows the requirements outlined in TEA-21. The Georgia Department of Transportation (GDOT) develops its 6-year program working in cooperation with county and city officials, other organizations representing rail, ports, bikeways, transit, aviation, and highways, environmental and conservation groups, and interested citizens. Annual regional forums are held to solicit input from these groups and organizations.

Candidate projects are identified from a variety of sources, from maintenance projects to safety, bridge, enhancements, and transit to overall corridor improvements. The projects are identified from simple visual observations to the use of output data from sophisticated management systems. These evaluations help determine priorities for projects considered through each process. Through consultation with local governments, GDOT identifies funding priorities that consider needs in rural, urban, and urbanized areas. Their first funding priority is maintenance of transportation facilities already in place. Also considered in the evaluation process are safety, traffic volumes, and geometric deficiencies. GDOT's 6-Year Work Program consists of federal- and state-funded projects approved by the Transportation Board. The federal portion of the first 3 years matches the federal STIP requirements.

### 3.6 Summary

As evidenced by a review of the practices of other states, most have made significant progress toward becoming multimodal agencies by the manner in which transportation investments are planned and programmed. Metropolitan Planning Organizations, Regional Planning Organizations, transit agencies, the freight industry, business interests, environmental organizations, public interest groups, and the public at-large are now playing an increased role in transportation planning. Many state departments of transportation are still largely highway-focused because the major financial commitment continues to be highway maintenance and operations.

Since the passage of ISTEA in 1991, state departments of transportation have expanded their roles to incorporate public transportation, airports, rail, water, bicycle and pedestrian modes into their short-range and statewide transportation plans. It must also be recognized that the funding authorized in ISTEA, TEA-21, and the most recent SAFETEA-LU is still largely directed toward highway and bridge programs. Also, the geographic location of states greatly influence the degree to which multimodal planning has been incorporated into the overall planning process; that is, states with a large number of metropolitan areas and high population densities have advanced more multimodal and intermodal solutions in their planning and programming processes.

Key observations from the review of state practices are summarized below.

- The states are continuing to develop processes to find ways to more effectively and efficiently invest the limited resources available for transportation.
- The states consider both technical and subjective measures to decide on which transportation proposals to fund.

- Public input and working with other agencies and organizations such as Metropolitan Planning Organizations and Regional Planning Organizations play a key role in the planning and programming processes.
- Although the major focus in developing short-range programs is on the highway mode, states are considering multimodal and intermodal solutions to corridor deficiencies and sub-area transportation plans.
- Maintenance and preservation of the existing system continues to be a top priority of the state departments of transportation.

## Chapter 4

# Recommended Project Prioritization and Evaluation System

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The project development process begins with preliminary needs analyses determined through system planning, goals and objectives, and the desired performance of the transportation system. A preliminary project scoping process begins to study deficiencies and develop project data for possible solutions. The multimodal project development phase involves regional and local input and a proactive public involvement process. Public input and project data are used to determine desirable and appropriate candidate projects to solve system deficiencies and modal needs. The PES serves as an analytical methodology to aid programming efforts and prioritize multimodal investments. Qualified projects are then programmed into the 3-Year Program of Projects in an open, public, and financially constrained manner.

Candidate projects are prioritized according to the PES criteria established for each mode. The prioritized list of projects resulting from the PES is used to help guide decisions on which projects to fund in the 3-Year Program of Projects. Engineering and transportation planning judgment are imperative for the consideration and inclusion of multimodal projects, transportation demand management strategies, and intelligent transportation systems technology in solving transportation needs along strategic corridors. While candidate projects are evaluated individually, selected projects for the 3-year program must fit together in a holistic and practical multimodal framework to create a seamless, efficient overall transportation system. The project development and prioritization process that leads to the proposed 3-year program of projects is shown in Figure 2.

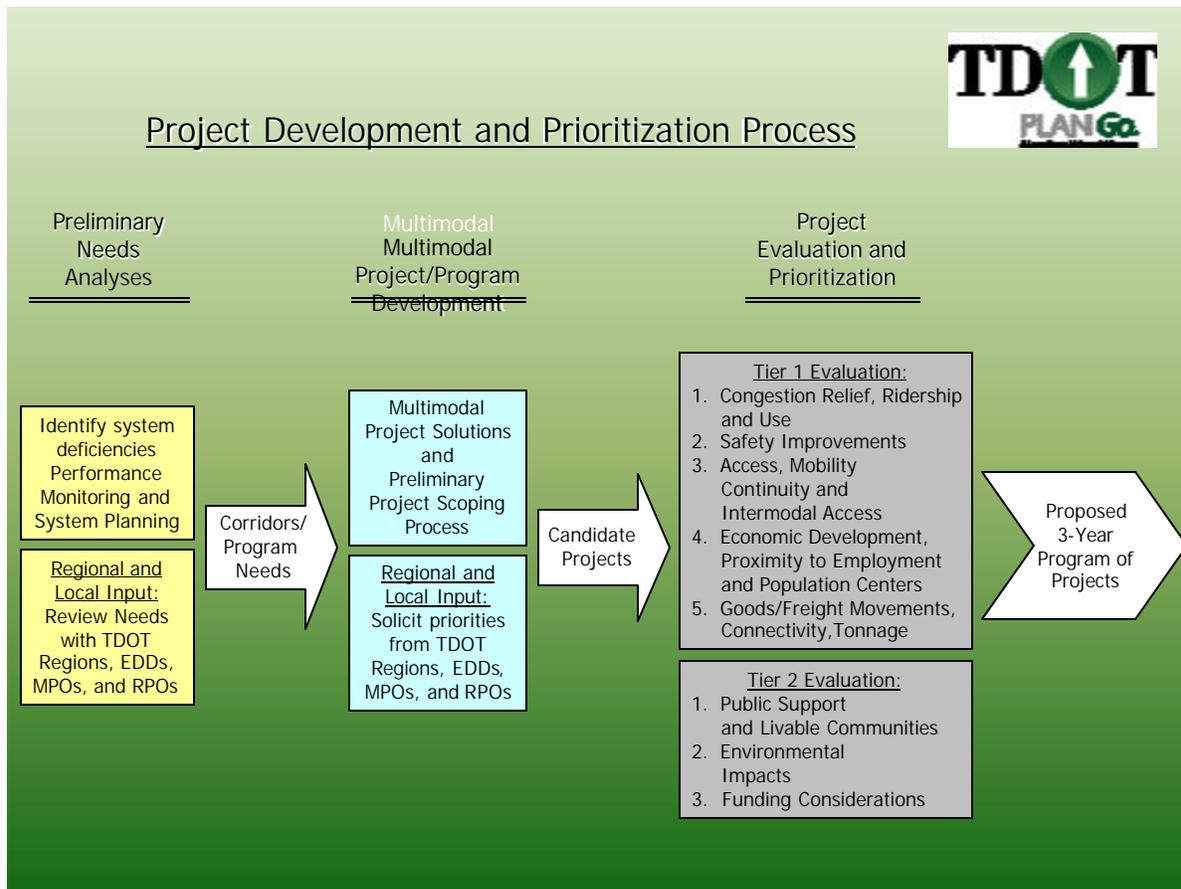
### 4.1 Multimodal Project Development Considerations

Solutions to transportation problems must consider a wide range of alternatives to meet identified needs and achieve the desired system performance. This, however, does not mean that every transportation improvement must involve a multimodal project to be a high priority for consideration in the 3-year program of projects.

Corridor studies within and between major metropolitan areas must assess the need to provide transportation choices in developing alternative solutions. The primary purpose of exploring multimodal solutions is to deliver quality projects and services to all transportation system users.

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) called for a major investment study to be conducted on all high-cost projects within metropolitan areas as part of the National Environmental Policy Act project development process. This federal requirement was subsequently rescinded as a project development activity, but the principles are still valid for major corridor studies, sub-area studies, and feasibility studies. These types of studies result in ensuring the best transportation solution is identified and developed to meet the mobility, social, and environmental needs of the corridor or sub-area.

Figure 2. Project Development and Prioritization Process



Multimodal corridor improvements may call for roadway widening to increase capacity, the incorporation of a high-occupancy vehicle lane, intelligent transportation system improvements, construction of bicycle and pedestrian facilities, passenger rail improvements, or park and ride lots, all of which contribute to solving identified transportation needs.

Once the multimodal solutions are determined for a corridor or sub-area, the PES can be applied to individual modal projects. Additional points are awarded to candidate projects that enhance modal choice by accommodating multiple modes of transportation or improve intermodal connections.

#### 4.2 Recommended Tiered Approach to Project Selection

The PES recommended in this report is to help guide the selection of transportation improvements in the general investment categories of expansion/enhancement and, to some extent, safety/modernization. Importantly, this process applies only to New Start projects. Projects or investments in the maintenance/preservation category are determined using established guidelines and procedures for each specific program.

The recommended PES is a **two-tiered approach** to project prioritization and project evaluation. Tier 1 evaluates projects based on mode-specific technical measures. These measures address Guiding Principles 1, 2, 3, and 4 as described in Section 1.2 of this report. The evaluation measures used for Tier 1 are congestion relief, use/ridership data, accessibility and mobility, economic development opportunities, goods and freight movement, and safety and security.

Tier 2 evaluates projects based on mode-neutral, generally qualitative measures. These measures address Guiding Principles 5, 6, and 7 as described in Section 1.2 of this report. The evaluation measures used in Tier 2 are public and community support, environmental impacts, and funding considerations.

### **4.3 Highway Project Evaluation System**

Tier 1 criteria used to evaluate and prioritize highways projects are described below. These criteria are developed to help select projects that meet the goals, objectives, and policies established in the LRTP. Candidate projects are scored based on established ranges and point assignments defined for each measure.

#### **4.3.1 Congestion Relief**

An LRTP objective is to implement affordable strategies that reduce chokepoints, congestion, and travel times for all modes. Therefore, the congestion relief measure was included in the PES to prioritize projects that achieve the greatest benefit for reducing traffic congestion. The criteria are intended to measure the extent to which a roadway carries an appropriate level of traffic for its design. The many aggregate measures of traffic congestion include the volume/capacity ratio, level of service (LOS), and vehicle miles traveled. The current average daily traffic for a roadway is used to determine the current use and significance of the route. If the proposed route is a new location, the base year traffic projections are used. Point assignments are developed for ranges of average daily traffic volumes based on the urban or rural classification of the route.

The projected improvement to LOS is also used to evaluate the impact of a proposed project on relieving congestion. Point assignments are distributed to projects based on the significance of the improvement to LOS. For example, a proposed project that improves the flow of traffic on a route from an existing LOS F to a projected LOS C in the design year was evaluated higher than a comparable project that improved traffic flow on a route from an existing LOS C to a projected LOS A in the design year.

#### **4.3.2 Access and Mobility**

Another LRTP objective is to improve connections between airports, highways, bicycle and pedestrian facilities, public transportation, railways, and waterways. The access and mobility criteria are intended to prioritize projects that improve transportation choices and the ease with which people are able to connect to the transportation system. Candidate projects are evaluated on how well they enhance route continuity and the significance of connecting intermodal facilities and major traffic generators. The PES also considers whether the project closes gaps in the overall route. Examples of projects that satisfy access and mobility criteria could be a

highway improvement project that connects the interstate system to a rail yard, airport, or large industrial area such as an automotive plant. Additionally, projects that include sidewalks, bicycle lanes, or transit facilities and improve access from a school, hospital, or large commercial area to population centers score higher on access and mobility criteria.

### **4.3.3 Economic Development**

An LRTP goal is for transportation investments to support economic growth, economic competitiveness, and tourism in Tennessee. An objective associated with this goal is to support economic development by linking commercial/retail areas, tourist destinations, and other activity centers through partnerships with communities and regions. Accordingly, how well a project improves access to major population areas and employment centers is considered in the PES. Areas of high population growth also tend to correlate to economic growth and a need for improved transportation infrastructure. Projects in areas with high population growth would receive points in the PES.

Additionally, criteria measuring the potential for economic development recognize the importance of transportation projects in areas with high unemployment, low incomes, and lack of economic opportunity. Also, projects on routes providing connectivity to a county seat also receive additional points. The county seat connector program is intended to benefit economic opportunity equally throughout the state by linking each of Tennessee's 95 county seats to the interstate system with a four-lane highway.

### **4.3.4 Goods and Freight Movement**

The movement of goods and freight is another indicator used to evaluate the importance of a route for the economic growth and development of a region. The existing or projected base year truck percentage along a route is evaluated to determine the importance of a project. The significance of the project for freight movements based on connectivity and tonnage is also considered in the PES.

### **4.3.5 Safety Considerations**

To maximize safety and security, the LRTP objective calls for reducing injuries, fatalities, and property damage in all transportation modes. Therefore, the highway project evaluation criteria include the current crash rate on existing routes. The PES uses this measure to prioritize projects on facilities that have crash rates greater than the statewide average. Crash severity is also considered in the PES. Projects that have the potential to reduce crashes by correcting geometric deficiencies, improving sight distance, reducing vehicular conflict points, and generally making facilities safer are awarded more points.

The Tier 2 criteria are qualitative measures used to further evaluate and prioritize projects in the PES. Tier 2 criteria are similar to Tier 1 because both help select projects that satisfy the goals, objectives, and policies established in the LRTP. Candidate projects are evaluated based on the criteria described below.

#### **4.3.6 Public and Community Support**

An LRTP objective is to establish regular collaborative decision-making opportunities with Metropolitan Planning Organizations, Regional Planning Organizations, Economic Development Districts, cities, and counties to develop plans and programs and coordinate land use and transportation decisions. Accordingly, the PES includes criteria to evaluate public, community, and local agency support. Candidate projects should build partnerships for livable communities by demonstrating adherence to local goals and initiatives. Strong local official and overall community support are also important criteria. Consistency with transportation demand management programs, congestion management systems, intelligent transportation systems, and access management plans can be used to compare candidate projects based on the long-term value to a community.

#### **4.3.7 Environmental Considerations**

The LRTP environmental goal is to protect, preserve, and enhance the social, historic, and natural environments of the state. To prioritize projects that promote good stewardship of the environment, criteria include impacts on neighborhoods, homes, businesses, schools, churches, wetlands, watersheds, ecosystems, water quality, air quality, and historic/archaeological sites. Projects that preserve or improve neighborhoods, cultural resources, and the natural environment are prioritized accordingly.

#### **4.3.8 Funding Considerations**

Providing accountability and financial sustainability in the expenditure of transportation funds is also part of the PES. The financial criteria incorporate legislative mandates, financial feasibility, and project readiness to evaluate the ability to fund a candidate project. Considerations such as financial feasibility, project readiness, geographic balance, and the urban and rural statewide distribution of funds are incorporated into the PES.

### **4.4 Transit Project Evaluation System**

Transit projects provide affordable transportation, and when implemented correctly, can reduce congestion and travel times. The Tier 1 quantitative evaluation criteria described below are recommended to help prioritize candidate transit projects.

Existing and projected annual ridership per capita is used to gauge benefits to the overall transportation system. Available capacity for new riders, including the elderly and disabled, is also an important consideration for usage. The number of route miles of service provided, hours of operation, and frequency of service are all factors that influence the benefits, efficiency, and service of the transit system. Criteria that evaluate improvements to convenience and quality of travel should also be considered. To evaluate the impacts of a candidate transit project on accessibility and mobility, criteria such as improvements to route continuity, intermodal access, and proximity to major attractors and generators are considered.

The potential for economic opportunity is also a consideration for candidate transit projects. Criteria evaluate the significance of a transit project providing access to and from major population areas and employment centers. Projects that encourage higher-density development, often referred to as transit-oriented development, or satisfy local objectives for land use policies rank higher, as do projects that enhance redevelopment potential and create and retain jobs. Economic opportunity criteria also consider projects that serve areas of high population growth and distressed areas of high unemployment.

Safety and security are always important considerations when evaluating any transportation project. Criteria such as the overall age and condition of a vehicle fleet can be used to evaluate the reliability of transit service. Projects that create a safer environment for transit passengers and employees should also receive a higher priority. Projects with the potential to reduce injuries and fatalities receive the highest prioritization under safety and security evaluation criteria. Examples of such transit projects could include adding new service or improving the frequency of service along routes with high crash rates and severity compared to the statewide average, transit lighting projects, and modernizing the transit vehicle fleet.

Tier 2 analysis should also be conducted for candidate transit projects. Similar to the criteria established in the highway mode, public and community support, environmental impacts, and funding considerations are all part of the overall evaluation of candidate transit projects.

#### **4.5 Airport Project Evaluation System**

Many of the current aviation project evaluation criteria correspond closely to the LRTP Guiding Principles, goals, objectives, and policies. Over time, as the Airport System Plan and LRTP are updated, the aviation project evaluation process can be further integrated into TDOT's overall PES. The Tier 1 quantitative evaluation criteria described below are recommended to prioritize candidate airport improvement projects.

Aviation criteria evaluate the usage of an airport. Criteria determine whether a project is identified in an Airport Layout Plan and the number of based aircraft. Access and mobility considerations determine how well the candidate project enhances intermodal access.

Criteria to evaluate the potential of aviation projects for economic opportunity are also similar to other modes. Candidate projects in economically depressed counties and areas of high unemployment are given priority over otherwise equal projects in other areas. Criteria evaluate the potential for new job creation and retention, while the proximity of a project to major population and employment centers is also an important consideration.

Safety and security is of paramount importance to the aviation industry. Criteria evaluate which airport projects satisfy or enhance state licenses, rules and regulations, compliance controls, and emergency services.

Tier 2 evaluations of community support, environmental considerations, and funding considerations are also important in the overall evaluation and prioritization of candidate airport projects.

## **4.6 Rail Project Evaluation System**

TDOT has little, if any, influence on projects for Class I railroads. The majority of TDOT's involvement in rail is with shortline railroads and improving safety for highway-rail grade crossings. The Tier 1 quantitative evaluation criteria described below are recommended to help prioritize candidate shortline rail projects.

Currently, an annual needs assessment is conducted by each railroad to determine existing and future needs and the associated costs to upgrade tracks to desired standards. The proposed rail PES should evaluate the movement of goods and freight from a statewide perspective as a primary consideration for candidate rail projects. Proposed rail use criteria should be based on the number of rail carloads, tonnage of bulk commodities, and products shipped per month. These criteria can correspond to the amount of freight diversion from trucks to rail, which in turn can relieve congestion. Improvements to route continuity, connectivity, and intermodal access are also important considerations for evaluating rail projects. The identification of a candidate rail project in a needs assessment further increases the priority of the project.

The potential for economic development from rail projects is evaluated based on the number of manufacturers and shippers served. Partnerships with development agencies and private companies are also weighed because they leverage scarce state funds. The potential creation and retention of jobs is also factored into the prioritization of rail projects.

Safety and security considerations for rail projects include criteria to evaluate improvements to the interface of rail with other modes. Crash rates and fatality statistics are particularly applicable for at-grade rail and highway crossings. Prioritization criteria should also consider improvements to track or bridge conditions.

Community support, environmental impacts, and funding considerations should also be evaluated in the overall evaluation and prioritization of candidate rail projects.

## **4.7 Waterway Project Evaluation System**

TDOT has no role in ownership of the waterway system and only minimal financial responsibility. However, TDOT must maintain relationships with all modal agencies responsible for transportation to foster a collaborative approach to transportation decision making. TDOT's investment in the waterway system is limited mainly to technical assistance and intermodal coordination with port development authorities, the Tennessee Valley Authority, and the U.S. Army Corps of Engineers. Monitoring of waterway system use data, the condition of dam and lock infrastructure, and intermodal access enhancement should be part of the waterway PES to support the agencies that have direct funding responsibility for system maintenance and operation. These activities are important and can have positive benefits on the economic efficiency and accessibility to Tennessee's waterways as well as the potential for new job creation and retention.

## **4.8 Bicycle and Pedestrian Project Evaluation System**

Except for transportation enhancement projects for specific bicycle and pedestrian facilities, the majority of new bicycle and pedestrian projects is influenced and completed in conjunction with highway improvement projects. The quantitative Tier 1 evaluation criteria described below are recommended to help prioritize candidate bicycle and pedestrian projects that are independent from highway projects. The *Statewide Bicycle and Pedestrian Plan* contains additional project evaluation methodologies and expands upon the criteria discussed here.

Candidate bicycle and pedestrian projects should be evaluated based on potential usage and/or their contribution to providing a viable transportation modal choice. Access and mobility are important issues in bicycle and pedestrian projects because everyone at some point in a trip is a pedestrian. The evaluation should consider access and mobility criteria to determine improvements to route continuity, intermodal connectivity, and the proximity of the project to major attractors and generators such as schools, parks, community centers, and retail centers. Candidate projects must also conform to ADA guidelines, and criteria should evaluate enhancements to ADA accessibility.

Economic opportunities associated with bicycle and pedestrian projects include tourism, redevelopment, and the transportation of disadvantaged/underserved populations. Criteria evaluate the potential of a project to complement state tourism and redevelopment opportunities. Projects can also help create and retain jobs or enhance local economies. For example, a new greenway facility could encourage retail and commercial redevelopment of an area. Criteria also consider the connectivity of a project to major population and employment centers and potential benefits to underserved populations and locations.

Providing a safe and secure transportation system for residents, visitors, and commerce is an important LRTP goal and consideration for candidate bicycle and pedestrian projects. Criteria evaluate and prioritize projects that mitigate gaps and barriers in the transportation system and improve geometric deficiencies such as narrow lanes or a lack of shoulders and sidewalks. The potential for projects to reduce crash rate and severity is also evaluated.

Tier 2 evaluations of community support, environmental impacts, and funding considerations should also be included in the overall evaluation and prioritization of candidate bicycle and pedestrian projects.

## Chapter 5

# Conclusion

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The PES is comprised of modal criteria to prioritize highway, transit, airport, rail, waterway, and bicycle and pedestrian projects. These criteria are developed for each mode in accordance with the Guiding Principles, goals, objectives, and policies established in the LRTP. Candidate projects are prioritized using a two-tiered approach that evaluates both mode-specific and mode-neutral project data and considerations. Tier 1 evaluates mode-specific technical and quantitative project data to determine improvements to capacity and system use, access, and mobility, economic development, goods and freight movement, and safety. Tier 2 evaluates mode-neutral qualitative project characteristics and is included in the PES to help determine transportation solutions that are the best choices for the overall transportation system. These Tier 2 criteria include public and community support, environmental impacts, and funding considerations. Thus, the PES establishes a methodology to prioritize candidate projects based on merit and without modal or geographic bias.

The highway PES was used in the development of TDOT's 3-Year Program of Projects presented to the State Legislature in May 2005. Candidate New Start projects were successfully evaluated openly and objectively to develop a list of projects to be funded. The implementation of the PES demonstrates a fundamental change to provide greater transparency based on data-driven performance measures and project evaluation criteria. Multimodal project development considerations and the complete multimodal project prioritization and evaluation system should be used to the extent possible as future updates to the 3-year program of projects are undertaken to ensure the best projects are implemented to satisfy Tennessee's transportation needs.

The PES does not require that projects meet or exceed a certain numeric scoring in order to be funded in the 3-year Program of Projects. This process is a means to assist TDOT decision makers in evaluating and comparing candidate projects. It is intended that the process outlined will (1) continue to evolve and improve over time, (2) continue to make refinements and enhancements in methodology, and (3) develop and incorporate new data sources and measures into the process.